Partnered Pavement Research Contract – Summary of Work Underway Following Current Strategic Plan

Title and Strategic Plan - PST No.	Summary of Objectives, Deliverables and Implementation by Caltrans	Expected Completion	Spent to date	Dollars to complete
RESEARCH SERVICES 2.1, 2.2, 2.3	Meet with pavement research partners in California and other states (including State Pavement Technology Consortium), monitor technical literature and research and report to Caltrans, serve on Caltrans/industry technical committees. Provide Caltrans-compatible databases. Provide pavement technology advice and distribute pavement information through technology transfer activities.	Ongoing to June, 2008		
Recycling – Use Asphalt Concrete as "pulverized" base, 2.4.2-#4	**Currently used by districts without standard guide**. Developing design gravel factor, performing Federal monitoring, lab & field testing, and life cycle cost estimate. Three projects built to date, three more in 2006.	Dec 2007	278,997	130,000
Dynamic Cone Penetrometer, 3.1.3	**Trained more than 200 Caltrans staff. Routinely used on foamed projects.**	Aug 2006	20,651	6,917
AC Long Life, 3.1.4-#11, 3.2.11-, & 4.7-#1D	**Developed original design approach, implemented on I-710 and in Highway Design Manual.** HVS testing to prove concept. Supporting specification development and implementation on second I-710 project, continue developing structural and mix designs, monitoring field performance, lessons learned.	June 2008	1,305,904	15,000
Develop New Asphalt Concrete QC/QA pay factor tables, 3.1.5-#4	**Develop & help Caltrans to implement revised pay factors-cooperative data from PPE2**. Based on WesTrack , HVS and lab testing; shadowed previous QC/QA projects; calibrating	Mar 2007	102,024	4,896
Support of Pavement Management System and Pavement Preservation, 3.2.4-#1A, 3.2.5-#1A, 4.5-#1C	**Identified changes in database & data collection that were implemented in Pavement Condition Survey and showed Ground Penetrating Radar useful for baseline PMS data.** Populated databases for portion of network to develop estimated costs, procedures, benefits for full network implementation. Evaluating past PMS data. Performance models for pavement preservation overlays.	Dec 2006	1,025,732	224,438
Develop Maintenance Test Sections Guideline, 3.2.9-#3C	**Currently being implemented. Posted on Maintenance Website.** Guidelines to improve quality of data and analysis obtained from Maintenance test sections to compare strategies.	July 2006	31,059	3,314
PG Binder Asphalt Specifications 3.2.12-	**Supported adoption of PG binder specs with Caltrans/industry. Developed & delivered training to >1,200 people in 17 classes including local gov't. Developed PG map.**	June 2006	83,602	20,000
Implementation of Mechanistic-Empirical Design, 4.1-#1C	**Support for concrete design changes implemented in Highway Design Manual. Help Improve Caltrans pavement performance by implementation of mechanistic design, integration of structure, materials, construction. Develop and assist Caltrans implementation of M-E design.** Help with decision document; evaluation of AASHTO 2002 method; measure seasonal effects through field monitoring; create climate, materials & truck traffic databases; extensive field (more than 100 sites) & lab testing; develop, verify, & calibrate design procedures; create design catalogs (rigid catalog being implemented); continued support underway.	Mar 2008	1,912,515	321,820
Rigid Pavement Long-Life Pavement Rehabilitation Strategies, 4.2-#1D	**Many results put into specs, HDM, & practice. Led to use of PCC instead of FSHCC for lane reconstruction.** Supported development and implementation by evaluating structural design and materials performance through HVS and lab studies and field monitoring.	Final report in review	3,542,125	200
Develop Construction Productivity Analysis Products for Pavement Rehab, 4.6-#1B	**Used on several projects in southern California, being promoted for all urban reconstruction projects.** Developed tools that permit reduction of construction duration and cost, and traffic delay through better planning, design and specifications Develop, implement, and train Caltrans on construction productivity software, CA4PRS. Apply and measure results in case studies. Help find pooled fund sources to augment Caltrans funding.	June 2008	832,981 (DRI funding)	245,020 (DRI funding)

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Dowel Bar Retrofit of Rigid Pavements, 4.8-#6B	**Caltrans decisions pending on implementation.** Evaluate Dowel Bar Retrofit, best options for implementation. HVS tests to compare retrofitted slabs with those not retrofitted, dowel types and designs. Develop preliminary performance & life cycle cost estimates for DBR. Evaluate alternatives to metallic dowels. Lab tests for corrosion resistance of metallic dowels.	Dec 2006	2,526,246	84,936
Investigate Asphalt Concrete Moisture Damage, 4.9-#12	**Steering Committee introduced to concepts, Dept will move forward once Section 39 completed.** Investigate causes and risk of AC moisture damage in California in field (more than 200 sites) and lab. investigate measures to mitigate risk. Analyze risk factors & mitigation measures; study moisture damage statewide; develop identification tools.	Done – Comments on final report	1,109,525	9,000
Develop Improved Rehabilitation Designs for Reflection Cracking, including Modified Binders (Rubber), 4.10-#1D	**Terminal blend specification validation done, moving to general recommendation based on results. Will reduce costs of overlays.** Study mechanisms of reflection cracking and develop improved methods of design. Evaluate & recommend most effective strategies for reflection cracking. Develop, verify, & calibrate reflection cracking models by HVS and lab.	Mar 2007	2,890,460	600,000
Recycling - Develop Mix and Structural Design and Construction Guidelines for Foamed Asphalt Bases, 4.12-#4	**Seven projects built, 6-7 more in two years. Results will make this a standard product to improve early opening to traffic& increase recycling.** Evaluate Foamed Asphalt, develop improved mix design and structural design practice. Develop recommendations for construction and design of foamed asphalt pavement. HVS and lab testing. Federal mandated monitoring of pilot projects. Coordinate with others using foamed asphalt including in other countries.	June 2008	1,296,550	320,000 (not counting future HVS tests)
Framework for Implementing Innovative Contracting For Transportation Infrastructure Rehab & Reconstruction 4.14-#3A	**Includes completed evaluation of District 11 chip seal warranty and gathering information from outside experts.** Provide Caltrans with a better understanding of risks and benefits of warranties based on life cycle cost analysis.	Sept 2007	229,813	122,000
Life Cycle Cost Analysis Tools, 4.15-#1B	**Provides tools to compare life cycle costs to be in compliance with AB 338. Implementing LCCA program summer 06. Includes completed re-analysis of life cycle cost comparison of conventional and long-life strategies** Provide tools for implementation of high-level life cycle cost analysis by Caltrans. Includes development of tools, collection of cost, strategy, models, software and performance data to support LCCA. Case studies of construction cost breakdown for four long-life projects. Will result in lower costs and more effective use of available funds.	Sept 2007	254,758	134,000
Quiet Pavement (Asphalt) and Open Graded Mix Design Improvements, 4.16-	**Helping Caltrans lead nation in Quiet Pavement technology and developing or adapting best practices. Supporting implement Chief Deputy directive.** Identify best practice for selecting asphalt surfaces based on performance trends identified from field measurements for noise, permeability, friction and durability. Includes international survey of research & practice; develop test capabilities (sound, friction), lab & field tests, monitor DEA sites.	June 2007	591,357	422,966
HVS Test of Precast PCC Slab in District 8, 4.17-	**Confirmed as Rapid Rehab strategy for use on I-15 pilot and for Long Life projects.** HVS tests of pre-cast panels in D8 used to establish performance parameters for pilot implementation on I-15. Moving to further pilots as long-life or Rapid Rehab method.	Dec20 06	1,208,321	400,000

POSSIBLE HVS TESTS	Highest rated (by Caltrans) of 12 topics for HVS test. All 3 have partnering potential.			
Extended Life Benefits of Pavement Preservation	Compare performance on cracked asphalt pavements of: slurry seals, microsurfacing, single and double chip seals (binder type: conventional asphalt, polymer modified binder, asphalt rubber), fog seals (asphalt emulsion, reclaiming agent), and Cape seals	1 month per test	N.A.	100,000 per test
Performance of Warm Asphalt & Low-Energy Mixes	Performance under HVS testing can help implementation of warm and low-energy asphalt, which offer potential energy and environmental benefits, and the ability to pave at cooler temperatures. Testing is needed to determine if pavement performance of warm/ and low-energy mixes is comparable to or better than conventional asphalt mixes.	16 months	N.A.	1.4 million + lab
Accelerated Test of Terminal Blends & Rubberized Asphalt Concrete	HVS tests can help Caltrans faces technical and cost challenges in meeting the goals of AB 338 and the requirements to increase recycled tire rubber used in asphalt highway pavements. Performance results under HVS testing can help reduce risk of costly early failures.	1 month per test	N.A.	125,000 per test (1.5 million for 12 tests)